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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •

JULY 13, 1935

Where Echoes Are Lost

See Page 31

A SCIENCE SERVICE PUBLICATION

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The Weekly Summary of Current Science

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DO YOU KNOW?

Canned broccoli is being packed in Portland, Oregon.

Insects have to keep their eyes open because they have no lids.

Honeybees seldom fly when the temperature is below 45 degrees Fahrenheit.

Russian scientists are making pictures of parachute falls, showing all positions of the body throughout the falling.

In the course of a year the U. S. Bureau of Plant Industry receives questions about no less than 200 plants which cause trouble as "weeds."

A rare 11-volume botany, written before 1790 by Volloso, a Franciscan brother in Brazil, has been acquired by the Field Museum of Natural History.

Why cancer is persistently rare in some sections of the United States and persistently common in others is an unexplained fact worth investigation, according to Dr. F. L. Hoffman, statistician.

Starting the day after Fourth of July, the American Museum of Safety began a nationwide study of fireworks accidents.

A new glass, which bends like steel and is called the world's hardest glass, appears to have a useful future in industry.

A spring recently found at Hot Springs National Park, Arkansas, will add 25,000 gallons of mineral water a day to the steaming waters.

The world's largest airship, now being built by Germany, will be 813 feet in length, and will have a gas capacity of 6,720,000 cubic feet.

Compulsory fumigation of ships at Liverpool, England, has reduced the average number of rats to a ship from 59 in 1923 to two in 1933.

Aside from the fact that Egyptians played cymbals, flutes, harps, and certain other instruments, nothing is known of their music, says one Egyptologist.

WITH THE SCIENCES THIS WEEK

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ZOOLOGY

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PHYSICS

Professor Albert Einstein Announces a New Theory

Seeks to Weld Relativity and Quantum Theories Into Single, More Powerful Tool for Scientific Research

PROF. Albert Einstein, Nobel prize winning scientist of the Institute for Advanced Study, has just announced a new theory which should profoundly affect the whole structure of physical science.

Continuing his world-recognized role as scientific "coordinator," Prof. Einstein offers the first mathematical "signposts" which may point the way to a welding of his own famous relativity theory and the new quantum theory into a single, more powerful tool for science.

Both relativity theory and quantum theory have been of such fundamental importance that the men who devised them have won the highest award in science—the Nobel prize.

Here are the outstanding, startling concepts in Prof. Einstein's new and yet-unnamed theory:

1. Space is pictured as two sheets.
2. Particles in space are envisioned as "bridges" linking the two sheets.
3. The most elementary particle in nature is one without gravitating mass, i. e., without weight.
4. Electricity and mass are not related but appear as independent constants in the equations.

In a report to the *Physical Review*, (July) official publication of the American Physical Society, Prof. Einstein, with Dr. N. Rosen, as collaborator, describes how his own general relativity theory accounts for the large-scale happenings of nature but fails when attempting to explain the atomic structure of matter.

Both Theories Incomplete

At the same time, he adds, quantum theory, while highly successful in describing the interactions of atoms and their still smaller parts, fails to explain phenomena in the field of relativity.

At present, depending on the job at hand, science chooses either one or the other theory as a "tool." In analogy science is now working like a carpenter who uses a saw to cut wood and a hammer to drive nails.

Prof. Einstein, in trying to combine the two theories, would like to have science (as a carpenter) have one tool which both cuts wood and drives nails.

Sufficiently complex in its mathematical details to tax the ingenuity of the legendary twelve men who were originally said to understand Einstein, the new theory of the distinguished professor pictures space as represented by two sheets. The presence of an elementary particle without electrical charge in this space is represented as a "bridge" connecting the two sheets.

Aids Understanding

With the help of this "sheet-space and bridge" picture, "one is able to understand the atomistic character of matter as well as the fact that there can be no particle of negative mass," Prof. Einstein reports.

An important and unusual outcome of the new theory is that the "most natural electrical particle in the theory is one without gravitating mass," to use Prof. Einstein's own words.

A particle without gravitating mass would be one which weighs nothing. This state of zero mass is represented by one "bridge" between the two sheets of space. (*Turn to Page* 20)

ENGINEERING

New "Butterfly" Lamp Reflectors Stop Glare

THE annoying gleam of street lights which enters the bedroom windows of city dwellers and interferes with their sleep should be a thing of the past if the new type of "Butterfly" reflectors invented by engineers of the Westinghouse Electric and Manufacturing Company are generally adopted.

Designed of polished aluminum in a shape resembling a great metallic butterfly, the new type reflector is being used in connection with sodium lighting for highways.

Because of the special shape, all the light is reflected downward and none laterally to bother sleepers along the roadside. Moreover, the reflectors are an aid to motorists because road glare from the overhead lamps is greatly reduced.

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"BUTTERFLY LIGHTS"

Samuel G. Hibben, Westinghouse lighting expert, is checking the wavelength of light from a sodium vapor lamp as it operates in one of the new "Butterfly" fixtures which throws the light downward, preventing glare in windows and motorists' eyes.

An electron or proton, according to the theory, would be a "two-bridge" problem.

Still another conclusion reached by the new theory is that the mass of a particle like an electron is not related to its electric charge. The charge (e) and the mass (m) are independent constants of integration, to use the mathematician's term.

In his analysis of his own new theory, Prof. Einstein gives as points in its favor:

1. It explains the atomistic character of matter.

2. It explains the circumstance that no neutral particles of negative mass exist.

3. It uses no other variables in the equations than those of the gravitational field and the electromagnetic field.

"On the other hand," Prof. Einstein concludes, "one cannot see *a priori* whether the theory contains the quantum phenomena. Nevertheless one should not exclude *a priori* the possibility that the theory may contain them."

Which, in effect, means:

While the new theory does not, at present, explain atomic happenings as does quantum theory, one should not jump at the conclusion that there is no possibility that it may do so.

One can be sure that Prof. Einstein and Dr. Rosen are hard at work right now trying to make the "possibility" much nearer a certainty.

The Authors' Words

The following is the description of the new theory in the words of Prof. Einstein and Dr. Rosen:

"The writers investigate the possibility of an atomistic theory of matter and electricity which, while excluding singularities of the field, makes use of no other variables than the gravitational field variable of the general relativity theory and the electromagnetic field variable of the Maxwell theory. By the consideration of a simple example they are led to modify slightly the gravitational equations which then admit regular solutions for the static spherically symmetric case. These solutions involve the mathematical representation of physical space by a space of two identical sheets, a particle being represented by a "bridge" connecting these sheets. One is able to understand why no neutral particles of negative mass are to be found. The combined system of gravitational and electromagnetic equations are treated similarly and lead to a similar interpretation. The most natural elementary charged particle is found to be one of zero mass. The many-particle system is expected to be represented by a regular solution of the field equations corresponding to a space of two identical sheets joined by many bridges. In this case, because of the absence of singularities, the field equations determine both the field and the motion of the particles. The many-particle problem, which would decide the value of the theory, has not yet been treated."

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GENERAL SCIENCE

Bill Provides $1,000,000 For Research in Agriculture

SCIENTIFIC research that will benefit future generations, as well as the present, is contemplated by a bill introduced in the House by Rep. Marvin Jones, of Texas. The measure has passed both House and Senate.

According to the terms of the bill, the Secretary of Agriculture "is authorized and directed to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects," and also to carry on investigations looking to improvements in handling and marketing, as well as "research relating to the conservation, development of land and water resources for agricultural purposes."

The research thus contemplated is to supplement, not to replace, other researches now going on under the aegis of the Department of Agriculture; but both activities are to be coordinated so far as practicable, and "shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish."

The initial funds for this work will amount to $1,000,000. This sum will be increased by an additional $1,000,000 each year until the total reaches $5,000,000, and thereafter the special research fund will be maintained at the latter sum each year. Forty per cent. of the total in any year is to be expended under the direct supervision of the Secretary of Agriculture, in any places and for any research purposes he may approve within the frame of the act. The remaining sixty per cent. will be prorated among state agricultural experiment stations according to the size of their respective rural populations. Funds thus allocated must be matched dollar for dollar by the states receiving them.

The establishment of new laboratories is within the authorizations of the act, since it is provided that funds may be used for the erection of buildings and the purchase or rental of land needed for the purpose. These laboratories might be set up in the major agricultural regions of the United States, in places designated by the Secretary of Agriculture.

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AVIATION

England Develops High-Speed Radio Operated Robot Plane

PILOTLESS, full-sized and radio-controlled airplanes capable of exceeding 100 miles an hour and reaching altitudes as high as 10,000 feet have been developed for anti-aircraft target practice by the Air Ministry in London.

The robot planes have the flight characteristics of the familiar Tiger and Moth types. Equipped with 130 horsepower motors, they can take off either from an airport or by catapult from an airplane carrier at sea.

In flight the planes sweep in great circles, with a maximum radius of ten miles, at all times under radio control from staff officers on the ground.

The search for better types of anti-aircraft targets has long been a pressing problem among the great powers of the world. The U.S.S.R., with its current emphasis on gliders and parachute jumping, has been reported by its news agency Tass to have developed a system whereby a train of gliders are towed

aloft by an airplane and then cut loose one by one to be shot at by anti-aircraft guns on the ground. The glider pilots set the course of the gliders and then jump safely to the ground.

The new British system of using high speed airplanes operated by radio control, while more costly, would appear to bring much more reality into the target practice.

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MEDICINE

Leprosy, Man's Ancient Foe, Fought With New Weapons

LEPROSY, one of the most ancient of human ills, is being fought with the most modern weapons in medical science's armamentarium. At the meeting of the American Association for the Advancement of Science's medical section, Dr. H. W. Wade of the Leonard Wood Memorial, New York City, told of new efforts against this old enemy.

Dr. Wade, who flew to the meeting from the ship on which he came in from the Orient, told of closer identifications of the bacillus that causes the disease. Different research workers had obtained different organisms, each of which was blamed for leprosy. Finally, one research worker was sent to different parts of the world, and his cultures from both Occident and Orient show the same bacillus. It is necessary to use special synthetic atmospheres containing 60 per cent. oxygen and a high concentration of carbon dioxide to keep the leprosy germs alive. This technique, the first to produce successful culture of the bacillus outside a living body, was worked out by Dr. Earl B. McKinley, dean of the medical school of George Washington University, Washington, D. C.

Efforts are also being concentrated on a method for testing suspected cases by a method more or less similar to the one used in testing for tuberculosis, but thus far they have not been particularly successful. However, they are being continued, with persistent hope for better luck in the future.

Leprosy, said Dr. Wade, is not confined to the tropics, as we are rather prone to imagine. Some of the worst cases in the world occur in Japan and Korea, which are temperate-zone countries. It is increasing in Argentina. It was known a thousand years ago in Norway, and used to be common in northern as well as southern Europe during the middle ages.

The disease appears to be transmitted mainly by close personal contact between the sufferer and members of his own family; though it is not known whether there is any hereditary tendency toward susceptibility. It is not primarily a "dirt disease," though lack of sanitation seems to have something to do with its spread in some cases. Badly balanced diets, such as are common in the Orient, seem to be a predisposing factor, Dr. Wade said.

Special efforts are now being made to recognize leprosy in its early stages, when it can be treated with greater success and less cost. This often involves house-to-house visits, for as a rule patients do not report to clinics until the malady is in an advanced stage, due to their own inability to recognize it at its inception.

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PSYCHIATRY

Sodium Rhodanate Useless For Mental Disease

SODIUM rhodanate, contrary to claims advanced for it, is of no value in treating mental disease, Dr. Purcell G. Schube, of the Boston State Hospital, has found. His opinion, based on experience with 75 patients suffering from various mental disorders, is reported to the *American Journal of Psychiatry* (May).

The sodium rhodanate treatment was advocated by Prof. W. B. Bancroft of Cornell University, who suggested that mental disease, dementia precox and manic-depressive psychoses, by the contrasted use of sodium amytal and sodium rhodanate.

Dr. Schube found, contrary to Prof. Bancroft's views, that it is impossible to differentiate between two types of mental disease, dementia precox and manic-depressive psychoses, by the contrasted use of sodium amytal and sodium rhodanate.

"The ideas of Bancroft and his coworkers relative to mental disease and the methods of treating it did not prove to be of any value at all when the experimental method was applied to them," Dr. Schube concluded. "They are therefore untenable."

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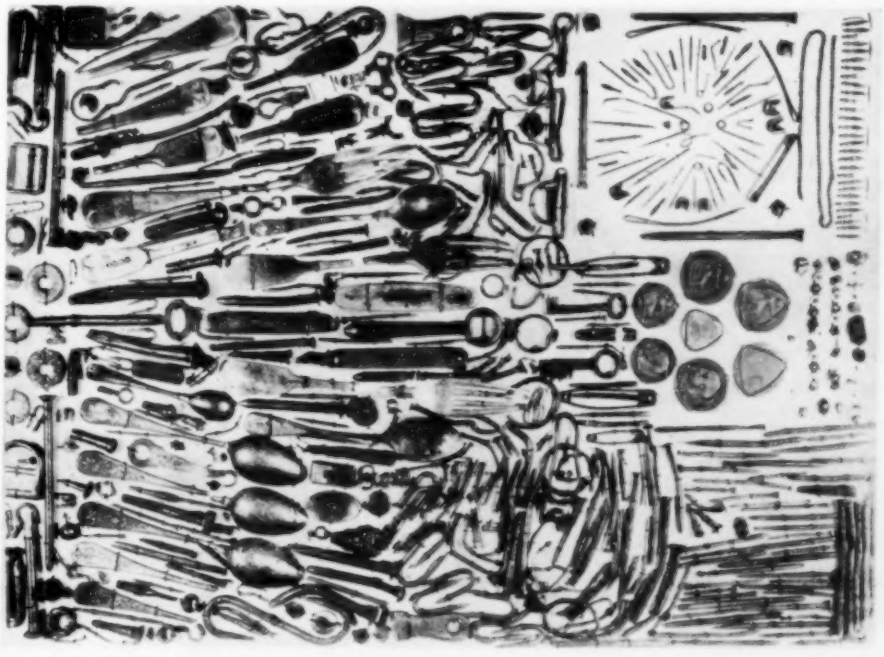

HE SWALLOWED THINGS

But not until an X-ray was made of his stomach was it known that a patient suffering from the mental disease, schizophrenia, had this collection of 500 foreign bodies inside him. A live revolver cartridge, 3 pocket knives, 37 phonograph needles, 45 needles and pins, and 218 nails and screws were included in the lot. The patient died. The case was reported in the British Medical Journal by Dr. R. Stewart Kennedy, of the Cheshire County Mental Hospital.

ASTRONOMY

Nova Herculis Is Again Increasing in Brilliance

Famous Exploding Star, First Brilliant At Christmas Time, Reaches Eighth Magnitude After Waning To 13th

NOVA Herculis, the newly discovered nova star whose peculiar astronomical antics have caused wide-spread interest within the past few months, is again increasing in brilliance, Leon Campbell of the Harvard College Observatory staff announced.

Rallying after it reached its faintest magnitude, 13, early in May, the star has now reached the eighth magnitude, has undergone marked spectrum changes and has definitely passed into what is usually termed the nebular stage, he said.

"It now looks as if the nova had passed through its stages of marked, and irregular, activity and that it will soon settle down to a point where it will slowly, but surely, decrease to the magnitude it was before its sudden outburst in December last," Mr. Campbell said. "The return to normal may require several years."

The star was discovered Dec. 13, 1934, by the English meteor observer, J. M. P. Prentice, and at that time was of the third magnitude, having flashed up from the fourteenth magnitude, probably, within a very few days, according to Mr. Campbell. (*SNL, Dec.* 22, 1934). From then until Dec. 22 the light of the nova steadily increased, with slight fluctuations, and on Dec. 22 the star reached the magnitude of 1.4 and was exceeded in brightness only by brilliant Vega.

Until April 1, the star was easily seen with the naked eye, varying between the second and fourth magnitudes, and then in two days it faded away at the rapid rate of about a magnitude and a half a day. After April 3 the decrease was more gradual, according to Mr. Campbell, until in early May it reached its faintest magnitude, 13, where it was seen only with the greatest difficulty with powerful telescopes.

The star is now clearly visible in small telescopes at any time throughout the night, passing through the zenith about midnight.

"Practically all the changes in brightness have been accompanied by changes in spectrum," Mr. Campbell said. "During the early stages, the nova was of a distinctly bluish color, indicating that it was then an extremely hot star.

"When first photographed, the nova showed a spectrum containing strong absorption lines of hydrogen, with the lines of the metals bordered by intense emission lines. As the nova became brighter the emission lines faded away and the star had a spectrum closely resembling that of the supergiant star, Gamma Cygni.

"After maximum light was reached, the emission lines flashed forth with customary nova brilliance, this indicating that the nebulous shell surrounding the star had become partially transparent. Later, the well-known green auroral lines appeared as have been found in many other novae.

"Since the comeback in the star's light, marked spectrum changes have occurred. The nova has definitely passed into what is usually termed the nebular stage. The spectrum is outstanding in many ways, even among novae, and therefore difficult of interpretation at this time.

"How bright will nova Herculis get? Judging by its prototype, Nova Aurigae 1891, probably it will not attain naked eye visibility but it will be visible in moderate sized telescopes."

At any rate, most of its activity is probably over, Mr. Campbell said, and it will soon settle down to a point where it will slowly decrease to the magnitude it was before its sudden outburst last December.

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ASTRONOMY

Strange Behavior of Nova Baffles Scientists

THAT Nova Herculis has science baffled in trying to explain its behavior, is the outstanding conclusion of a symposium, held in connection with the meeting of the Pacific division of the American Association for the Advancement of Science.

But while now puzzled, the astronomers are going to do something about it. New instruments are being planned which will carefully scan the sky for the appearance of similar nova outbursts in the future and find them quicker. With the anticipated increase in observations of novae, the physical laws which govern their apparent erratic behavior may become known.

The astronomers who have been observing Nova Herculis for the last seven months have watched it wax and wane in brightness. A check on the "life histories" of former nova stars revealed that it has behaved like none of them.

All the astronomers can agree on now is that there is no standard behavior for an exploding star. Each is unique and a law unto itself. They all flash up quickly and then die down more slowly, but not in uniform fashion. Their antics cannot be predicted with knowledge now at hand.

It is the lack of knowledge which has led to plans for "nova finders" which, while still in the "paper" stage, may soon bring science out of its ignorance in the study of exploding stars.

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PHYSICS

Extra High Voltage Not Needed To Cause Lightning

THE ENORMOUSLY high electric voltage which science has always associated with lightning bolts appears to be unnecessary.

Lightning progresses through a series of steplike jumps, and each jump requires only a part of the millions of volts potential necessary to jump from a high cloud to the ground.

Dr. B. F. J. Schonland, D. J. Malan and H. Collins astounded the learned Royal Society of London with the experimental proof so upsetting to science's previous conceptions of lightning's behavior.

Eighty-year-old Sir Charles V. Boys, inventor of the special high-speed camera which Dr. Schonland and his colleagues used in the new work, said the discovery was "an amazing phenomenon which could never have been predicted." (*See SNL.*, Mar. 17, 1934, for report of former experiments.)

It is found that when a multiple lightning flash occurs there comes first a slow-moving "stepped leader," which precedes the first flash. Compared with subsequent happenings in the lightning stroke, this preliminary "leader" is slow, lasting as long as a fiftieth of a second. It is possible to overlook this action when the Boys camera runs at its fastest speeds.

The leader starts as a small spurt of light covering from twenty to 200 yards at a jump.

Then the streak disappears entirely for about fifty millionths of a second. Next a new dartlike streak starts at the point of cessation of the first streak and travels about as far as the first. Thus, the lightning "leader" reaches the ground in a series of from eighteen to twenty jumps.

With the atmospheric path thus cleared by the leaders, the first real flash occurs, which jumps upward from the ground to the cloud with a velocity of about 31,000 miles a second (one-sixth the velocity of light). This is the flash seen by the eye.

The leader streaks constantly vary their direction and may even go two ways at once. This is the origin of the irregular path of lightning.

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PSYCHOLOGY

Happy Marriages Run in the Family, Survey Reveals

MARITAL happiness runs in families. Those lucky people who are happy in their marriages are so because they have inherited or acquired a disposition just a little more amiable and affectionate than those whose marriages go on the rocks. This is reported as "the most reasonable explanation" of facts revealed by a survey of California marriages by Drs. Lewis M. Terman and Paul Buttenwieser. (*Journal of Applied Psychology*, May).

If you want to be happy in marriage, therefore, pick out a good mother-in-law. Of the 99 marriages for which these figures were available, 83 per cent. reported that the wives' parents had average or more than average happiness in their marriages. And 88 per cent. of the husbands came from happy homes. Nearly 87 per cent. had happily married parents on both sides of the family.

Can June-November marriages be successful? The California scientists found that traditional prejudice against age differences between husband and wife is strongly challenged by the facts. The age differences among the couples studied varied from one case in which the husband was 7 years younger than his wife to three others where the man was 15 or more years the senior. No relation was found between age difference and happiness.

Children in the home are not a guarantee of bliss. Although the presence of children may prevent divorce in some cases, this survey indicated that they have no effect upon the happiness of the parents.

Of considerable importance, however, is the agreement of husband and wife on whether or not they want children.

Nearly a third of the happily married couples reported that all of their interests outside the home are shared by the husband or wife. The other two-thirds, with very few exceptions, told of some outside interests held in common with the other member of the marriage. The unhappy couples, by contrast, included only 10 husbands and wives who reported such harmony on all their outside interests.

The boy who grows up tied to his mother's apron strings is not prevented by this from making a happy marriage, so far as this study reveals the facts. Happily married persons, both men and women, report more affection for both father and mother and less conflict with them, than is reported by the unhappily married. This fails to confirm the psychoanalytic theory that excessive attachment to the parent of the opposite sex interferes with a later happy adjustment to married life.

"The conclusion must be either that the theory lacks foundation or that a questionnaire of the type used in this study fails to obtain the facts it seeks to uncover," the scientists comment.

"It might be argued that parent-child relationships become so overlaid by rationalization and compensatory phenomena that the true facts can only be brought to light by psychoanalytic procedures, never by casual questioning. We do not feel competent to pass on this point, but would venture two alternative explanations. . . .

"It seems to us that the most reasonable explanation is that members of the happy group are by inherited or early-acquired disposition a little more amiable and affectionate, on the average, than the members of the unhappy group. This disposition would account for the satisfactory relationship both with parents and with spouse.

"Another possible explanation is that the mere fact of present marital happiness or unhappiness tends to affect the subject's report of his relations to his parents . . . as though these states were colored glasses lending their own distinctive hues to whatever is seen through them."

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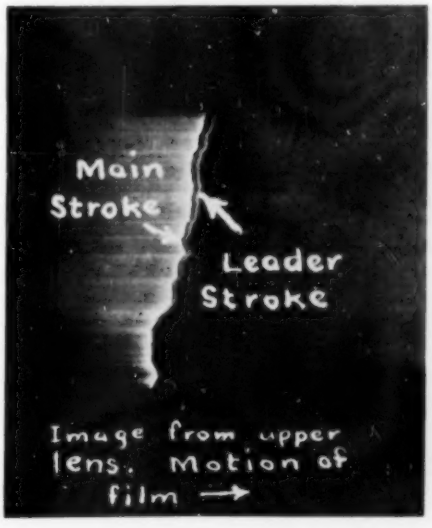
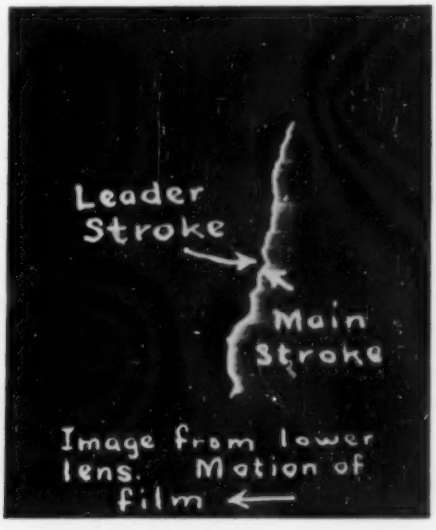




LIGHTNING DOES STRIKE TWICE

How a special high-speed camera, invented by the veteran British scientist, Sir Charles V. Boys, "sees" a lightning stroke. Many "strikes" in the same place within a fraction of a second is one finding which annuls the old saying that "lightning never strikes twice in the same place." These photographs were taken with a Boys camera owned by Alfred P. Loomis, of Tuxedo Park, N. Y. General Electric scientists W. L. Lloyd and W. A. McMorris obtained the pictures, which are similar to earlier photographs made by Dr. B. F. J. Schonland in his South African lightning experiments.

SEISMOLOGY

Earthquake Shakes Pacific Coast of Mexico

THE MEXICAN coast 250 miles west southwest of Mexico City was rocked by an earthquake at 1:49 a. m., on June 29. "Very clear" and "fairly strong" was the description of the shock reported by seismological stations throughout North America.

The epicenter was located at 18 degrees north latitude and 103.3 degrees west longitude, according to calculations made by the U. S. Coast and Geodetic Survey from telegraphic data supplied by Science Service.

This would make the shock center just a few miles off the coast where the Mexican continental shelf drops rapidly off into the depths of the Pacific Ocean.

Seismological stations reporting to Science Service include: University of Michigan; private station of Mrs. M. M. Seeburger, Des Moines, Iowa; St. Louis University, St. Louis, Mo.; Canisius College, Buffalo, N. Y.; Georgetown University, Washington, D. C.; Penn State College, State College, Pa.; University of California; Seismological Observatory, Pasadena, Calif.; and the U. S. Coast and Geodetic Survey stations at Honolulu, Ukiah, Calif., Tucson, Ariz., and Chicago.

Science News Letter, July 13, 1935

HORTICULTURE

Only 124 Plant Patents Granted In 5-Year Period

PATENTED flowers, fruits and other plants have not accumulated very fast since the plant patent law went into effect five years ago, on May 23, 1930. Files of the U. S. Patent Office show only 124 plant patents of all kinds, contrasted with the thousands of patents on mechanical devices and processes that pour from inventors' brains every year.

Four classes have thus far proved sufficient for the arrangement of plant patent records: roses, other flowers, fruits, and "plants"—the latter category being a catch-all for everything that is not classifiable as either flower or fruit.

Aside from roses, patented flowers have run rather strongly to carnations, dahlias, chrysanthemums and freesias. Among patented fruits, apples, plums, cherries, grapes and avocados are conspicuous. Patented vegetables are conspicuous by their absence, but there is one patented mushroom.

The highest number of plant patents granted to a single applicant is nine, to the estate of the late Luther Burbank. The Burbank patents include two roses, five plums, one peach and one cherry. There are at present, however, several commercial nursery companies that hold numerous plant patents, sold or assigned to them by the inventors. A number of patents have been granted to breeders in England, Holland, Czechoslovakia and other foreign countries; most of these have been assigned to American firms.

To be be patentable, a plant must be capable of "asexual" propagation, that is, it must be reproduced from cuttings, bulbs, grafts or by means other than seeds. From the provisions of the law, however, tuber-propagated plants like potatoes are excluded.

When an application for a plant patent is received it is not only examined by officers of the U. S. Patent Office, but is submitted also to the bureau of plant industry, U. S. Department of Agriculture, which has a corps of botanists and horticulturists capable of judging whether the variety is really new and distinct, and also of certifying whether or not its method of propagation makes it eligible to patent rights under the law.

Science News Letter, July 13, 1935

BOTANY

"Cow Tree" May Be Future Source of Chewing Gum

GUM CHEWERS may in future get their favorite chicle confection from a still-unused Central American tree species, Dr. J. S. Karling, Columbia University botanist, suggests. (*American Journal of Botany*, June).

Dr. Karling has made a preliminary investigation of the chicle-yielding properties of a milky-sapped tree which the natives of Guatemala call the "palo de vaca" or "cow tree." Its latex is described as "copious, rich, creamy, sweet and palatable." Specimens growing in the Central American rain-forest reach a trunk diameter of as much as five feet. The bark is thick, and easily tapped without doing permanent injury to the tree.

Dr. Karling does not expect immediate use of gum from this tree. Considerable further research is necessary, he says, especially on the chemical treatment necessary to make a good chewing-gum base out of it, and also to determine the adaptability of the tree to plantation cultivation.

The botanical name of the species is Couma guatemalensis.

Science News Letter, July 13, 1935

IN SCIE

MEDICINE

Claim Fatal Blood Disease Is Related to Hay Fever

A VERY serious blood disease, in which white blood corpuscles are destroyed to a dangerously low number, is physiologically related to hay fever, asthma and other allergic troubles, Drs. Theodore L. Squier and Frederick W. Madison of Milwaukee, Wis., told a medical audience at the meeting of the American Association for the Advancement of Science. This malady, known to physicians as granulocytopenia, has come into increased prominence recently, with the widespread use of pain-allaying drugs based on amidopyrine.

It has been commonly thought that the drug caused the disease simply by poisoning the systems of its ill-advised users. However, Dr. Squier pointed out that considering the large numbers of users, many of whom take massive doses without being affected, a different type of action must be considered as a cause. Further, patients who have recovered from attacks of granulocytopenia sometimes become seriously ill again from extremely minute doses, which is exactly the way in which hay fever or asthma is brought on in persons "sensitized" to such things as pollens, feathers or hair.

Science News Letter, July 13, 1935

OCEANOGRAPHY

Artificial Darkening Makes Glaciers Melt Faster

WATER for irrigation will flow more abundantly in the rivers of dry Central Asia, if a scheme tried experimentally by Soviet scientists works out successfully on a larger scale.

At the Tien-Shan Observatory on the Davydov glacier in Central Asia, a thin layer of dark, heat-conducting material was spread on the ice. It speeded melting as much as four or five times on sunshiny days, and even on cloudless days doubled the normal melting rate. Further experiments are now in progress, to find the most suitable material for large-scale controlled glacier melting.

Science News Letter, July 13, 1935

ENCE FIELDS

PHYSICS

Expansion of Universe Sole Explanation of Red Shift

ARE the distant nebulae redder than the nearer ones because they are receding with enormous speed or, as many would like to believe, is there some other explanation such as attributing the red shift to the action of electrons in free space?

Prof. Roy Kennedy and Walter Barkas of the University of Washington announced at the meeting of the Pacific division of the American Association for the Advancement of Science that they had tested the matter experimentally and found that electrons could not be held responsible because there are not enough of them.

They used a special instrument called an interferometer, designed by Prof. Kennedy, which is capable of detecting a change of a billionth of an inch in a foot. Still no effect of electrons could be seen even with millions of millions present. Prof. R. C. Tolman, new president of the Pacific division of the Association, announced that he and Dr. Edwin P. Hubble, recent winner of the Barnard medal for his work on the red shift, were practically convinced that no known effect other than recession of the nebulae was competent to account for the observations of the red shift.

Science News Letter, July 13, 1935

PUBLIC HEALTH

Large Cities Have Lowered Diphtheria Death Rate

A BRILLIANT lowering of the death rate from diphtheria in large cities of the United States is reported by the American Medical Association in its twelfth annual survey just completed.

Only one section of the country—the east south central states—failed to share in the tremendous inroads being made against this enemy of childhood.

Fifteen large American cities of the ninety-three covered in the survey had not a single death from diphtheria during 1934. They are as follows:

Cambridge, Mass.; Canton, Ohio; Duluth, Minn.; Elizabeth, N. J.; Grand Rapids, Mich.; Long Beach, Calif.; New Bedford, Mass.; New Haven, Conn.; Salt Lake City, Utah; Seattle, Wash.; South Bend, Ind.; Spokane, Wash.; Springfield, Mass.; and Syracuse and Utica, N. Y.

The ten cities with the lowest death rates from this disease in the last five year period, according to figures published in the *Journal of the American Medical Association* (June 15), are: Grand Rapids, Mich.; Salt Lake City, Utah.; Duluth, Minn.; Seattle, Wash.; Syracuse, N. Y.; New Haven, Conn.; Yonkers and Rochester, N. Y.; Spokane, Wash.; and Long Beach, Calif.

Also listed are the ten cities with the worst health records as regards diphtheria: Lowell, Mass.; Louisville, Ky.; Knoxville, Tenn.; El Paso, Texas; Chattanooga, Tenn.; Nashville, Tenn.; Atlanta, Ga.; Jacksonville, Fla.; New Orleans, La.; and Somerville, Mass.

Baltimore, which had a high diphtheria death rate for 1925-1929, now not only leads the group of south Atlantic states but has one of the best rates among the thirteen cities of the country with more than 500,000 population. San Francisco and Philadelphia alone surpass it.

South Bend, Ind., has had its third successive year without a diphtheria death, a new record among American cities.

Five cities reported that they had only one diphtheria death each in 1934, and it occurred in a non-resident. These cities are Providence, R. I.; Worcester, Mass.; San Francisco and Long Beach, Calif., and Tacoma, Wash.

Science News Letter, July 13, 1935

PHYSIOLOGY

Raw Sauerkraut "Cure" Contains Liver Vitamin

RX: Sauerkraut, raw. Sig: One pound, eaten daily. Keep it up for many months.

This is the prescription you would be likely to get if you undertook the new "kraut cure" which is becoming popular in Germany and Austria. An article in the *Muenchner Medizinischer Wochenschrift* recommends it as beneficial in rheumatism, asthma and some types of digestive troubles.

The benefits of the "kraut cure" are ascribed to its high content of lactic acid and choline. The latter has recently been identified by Dr. C. H. Best and associates of the University of Toronto as a new vitamin, necessary for the normal function of the liver.

Science News Letter, July 13, 1935

BOTANY

New Evening Primrose Developed At Princeton

THE unexplained disappearance of a deadly lethal factor from its hereditary make-up has made possible the appearance of an unusual new type of evening primrose among the experimental plants of Dr. George H. Shull, professor of genetics and botany at Princeton University.

The new variety, which put in its appearance for the first time this spring, is characterized by leaves whose petioles or leaf-stems are longer than the blades of the leaves themselves. They form a marked contrast to the normal leaf, which is over ten times as long as its leaf-stem or petiole, and for this reason Dr. Shull has named the new variety *Oenothera petiolaris*.

Science News Letter, July 13, 1935

ARCHAEOLOGY

Ruined Villages Show Indian Farm Cycle

TRASH heaps in 97 ruined and abandoned Indian villages are telling a government scientist new facts about farming in the Dakotas along the Missouri River, in Indian days. Abundant pottery, corn and tools are thrown together in huge refuse piles in all of these Indian villages, Alfred Bowers of the U. S. Department of Agriculture, stationed at Stanley, N. D., reported to the American Association for the Advancement of Science.

"Based on the rate of accumulation of these refuse piles in dated historic villages" he said, "where the time both of building and abandoning is known, it becomes evident that a large population of earthlodge tribes formerly lived in the region."

Mandan Indians who lived in earthlodges and farmed for their living reached the locality of Pierre, S. D., before 1200 A. D., Mr. Bowers estimates. These and other farming tribes, well organized for defense, drove out roving buffalo-hunting Indians.

This Indian farming cycle ended about 1862. The nomad Plains tribes found that, with horses, guns and knives, they were more than a match for the once-feared villagers. When contagious diseases swept the villages, the conquest was complete, and only a few miles of the river were left to the earthlodge tribes.

Science News Letter, July 13, 1935

ARCHAEOLOGY

Pharaoh's Palaces Found

Egyptian Palace Scenes in Stories of Moses and Joseph At Last Identified By Tiles From Walls

By EMILY C. DAVIS

START to name the most famous palaces of history—you won't go far without saying:

"Oh, and the palace of Pharaoh in the Bible! Why, that was where Joseph came from prison to interpret Pharaoh's dreams, and where Moses was brought up by the Egyptian princess who found him in the bullrushes. And where Moses stood before Pharaoh and warned him to let the enslaved Israelites go."

And perhaps you would add:

"Wonder what that old palace was like."

For in all the centuries that people have told and retold the stories of Joseph and Moses, they have never been able to describe the palace of Pharaoh, or point to it on the map of Egypt.

But now they can, for the palace—or rather palaces—have been found, there is good reason to believe.

The Metropolitan Museum of Art in New York has in its possession several hundred pieces of decorated tiles from Egyptian palaces at el Kantir. And the Museum announces that "in all probability el Kantir is the city Raamses of the tradition of the oppression."

"In fact," declares H. E. Winlock, director of the Museum, and well-known Egyptologist, "there is ample reason to believe that these tiles come from the walls of the very palaces which —traditionally at least—were the scenes of the stories in the latter part of Genesis and the first part of Exodus."

Known By Bible Writers

Making this announcement in the Museum's official Bulletin, Mr. Winlock explains that he is not concerned with the historic accuracy of the Bible narratives. That is a different problem. He is saying that whoever wrote down the life stories of Joseph and Moses, long after they had died, knew of the palaces of el Kantir. And these palaces—there were several, it now appears —were chosen by the Bible narrator as the stage for Israelite dramas in Egypt.

"From this stage," says Mr. Winlock, "we have retrieved a few bits of colorful scenery."

Bits of this rarely interesting scenery have been placed on exhibit in New York at the Museum. They consist of 40 tiles decorated with pictures and belonging to one palace. They show for the first time what the throne rooms of the Bible stories were like, and the sort of pictures on which the eyes of Moses and Aaron rested as they approached the throne to give Pharaoh their defiant messages. The art of the throne room was not calculated to encourage defiance—just the opposite. It was enough to make all subjects of Egypt tremble.

Mr. Winlock identifies certain tiles as belonging to the throne surroundings, and his description offers artists and story tellers new details for their representations of Bible Pharaohs:

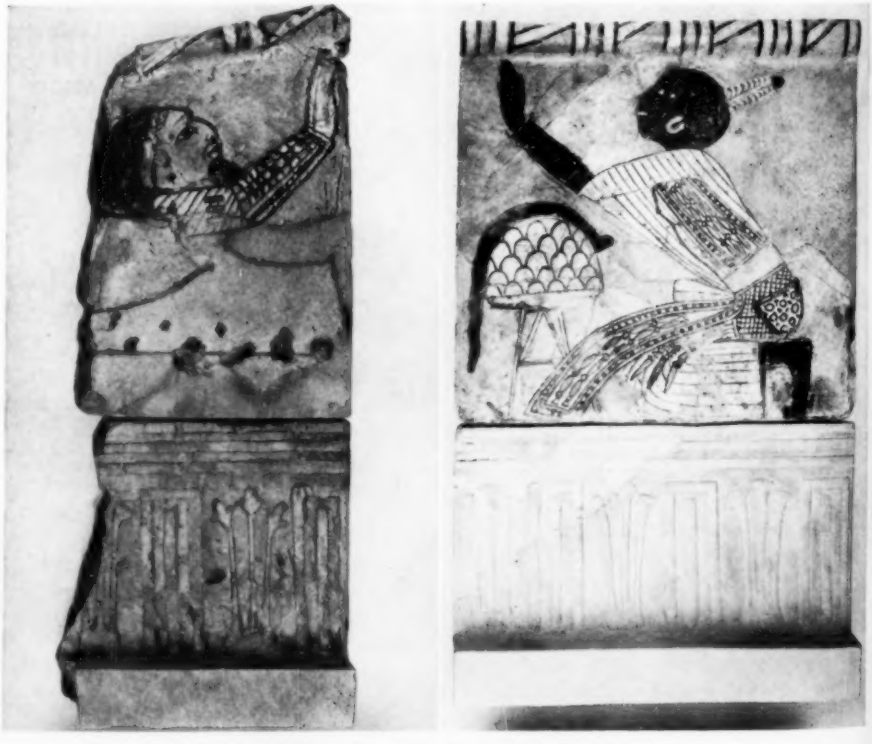
"Some (tiles) incased the sides of the low platforms on which the Pharaoh's throne was placed, and most appropriately they show foreigners kneeling or prostrate around him—the Negroes and Libyans of Africa, and the innumerable tribes of western Asia, clad in their richest garments.

"Up to each dais went tiled steps on which were portrayed Egypt's enemies, with pinioned arms, lying where the Pharaoh would tread upon their prone bodies whenever he ascended his throne.

"Each newel post at the foot of such a flight of steps would have, molded in green faience, a lion of Pharaoh rampant, grasping a bound captive whose head he gnaws."

The Museum has one of these hungry royal lions from the throne steps. The victim clutched in the paws has unfortunately lost his head by breakage, an accident suggesting vividly that the lion has already taken a large bite.

No palace has ever before been found in Egypt so extensively decorated in faience—glazed and painted clay tiles and ornaments—as this palace from which the Museum has pieced together



ARROGANT ART FOR THE PUBLIC

The Bible Pharaohs liked to have this type of art in their public rooms. A Hittite and a Negro are shown humbly kneeling in these tiles that decorated side steps to the dais of the throne. These and the other illustrations from the Pharaohs' Palace are official photographs of the Metropolitan Museum of Art.

GRACEFUL DESIGN FOR HOME

In private rooms of the palace, a Pharaoh could drop some of his arrogance and be himself. Tiles found in one of the Bible palaces suggest this, by the informal nature scenes that adorned private apartments. A canal filled with ducks, lotus blossoms and fish was a popular art theme, used several times.

40 tiles. Decorated tiles formed wall borders in state apartments. Tiles were inlaid into door and window frames, and the railings of the royal balcony.

In the audience halls, says Mr. Winlock, the subject of the tiled decoration appears always to have been the same: defeated enemies supplicating Pharaoh or trussed up for execution.

These art scenes may have created a formidable atmosphere in their heyday, but they fail to awe modern Egyptologists, who know the weakness as well as the power of Egypt's monarchs.

Mr. Winlock comments: "It was a queer, complacent, ostrich-like attitude that prompted the Egyptian to surround himself with such arrogant decorations when he was only too glad to buy off the enemies he frequently could not defeat."

In the private rooms of the palace, the king and his household could drop some of the royal arrogance and be themselves. The tile pictures from private apartments suggest this by their attractive nature scenes. A canal full of ducks, fish and lotus flowers was a popular art motive, used several times in the informal rooms of the palace. Bits of tiles from one room picture young girls carrying pet gazelles. And probably from bedrooms are parts of frieze showing the grotesque god Bes, who seems to have had among other duties the task of guarding over sleepers.

Names a Clue

Names of kings who owned the palaces of el Kantir, and the geographic location of the city are the chief clues that link the new discoveries with Bible stories.

Bricks and tiles from the palaces bear the names of Sethy the First, Ramesses the Second, Mer-en-Ptah, and many other kings of the fourteenth to twelfth centuries B.C. who reigned during the period generally ascribed to the Bible record. The palaces were thus occupied throughout two centuries, during which time Mr. Winlock finds excellent reason to believe they were the northern residence of Egyptian kings.

Geographically, the palaces fit neatly with the Bible account. El Kantir is just beyond the confines of the "land of Goshen" where Joseph settled his brethren to have them near him while he dwelt at Pharaoh's court. The Israelites were still dwelling in the land of Goshen, in the fertile delta of the Nile, when a Pharaoh who "knew not Joseph" set them to labor for him under hard taskmasters. For this hard Pharaoh, the Israelites had to build treasure-cities—which sometimes are interpreted to mean garrisons or fortresses.

Treasure Cities

The Book of Exodus says that "they built for Pharaoh treasure cities, Pithom and Raamses. . . . And the Egyptians made the children of Israel to serve with rigour: and they made their lives bitter with hard bondage, in mortar, and in brick."

"Perhaps," comments Mr. Winlock, "it was actually while building the palaces at el Kantir that the command of Pharaoh went forth to his taskmasters to give no more straw to the children of Irsael for the brickmaking required of them."

The store-city of Pithom was excavated in 1883, and discovery that Ramesses the Second's name was much in evidence there, and colossal statues of him were in the ruins, did much to link this ruler with the oppression of the Israelites. However, scholars have never agreed as to which king of Egypt figured in the stories of Joseph and Moses, and the Israelite escape across the Red Sea.

Mr. Weigall associates el Kantir with the other treasure-city, Raamses.

How the Bible palaces were identified becomes the newest told detective story in Egyptian archaeology.

As in many another archaeology mystery, the solution of this one began miles away from the spot, and the solution has taken years to unfold.

It began fourteen years ago in Cairo. When the Metropolitan's Egyptian Expedition arrived in Cairo that autumn, they were soon being offered extraordinary fragments of faience tiles. A number of antiquity dealers around the city had these remarkable tiles for sale.

Where were the pieces unearthed? The archaeologists were, of course, eager to know. All from one place, the dealers admitted. But the place was described vaguely. East of the Delta, was one answer. Near Fakus, was another. El Kantir still another. That last name was a direct clue, the very place to look, but the tile buyers did not realize that then.

Few Clues

The archaeologists turned to a Sherlock Holmes examination of their prize purchases, but all they could find that seemed significant was the fibrous plant roots clinging to some tile pieces. That meant the missing ruins would be found in cultivated lands of Egypt, not barren desert.

"We purchased all we saw that winter," says Mr. Winlock, telling of the tile adventures, "and when more pieces were to be seen in Cairo during the winter of 1928 and 1929, we again purchased all the fragments on the market."

Meanwhile the Egyptian Antiquities Service trailed the tiles to the "gold mine" of the antiquity dealers, at el Kantir. There the Cairo Museum began digging, and many more broken tile pieces emerged from the sites of ancient palaces.

Some of the scraps fitted directly on to scraps that the Metropolitan had acquired. The jigsaw puzzle that was emerging was not only incomplete, but the pieces were divided three ways. Some were in Cairo, some in New York, and some in the Louvre, in Paris.

The Metropolitan had several hundred of the fragments ranging from "pieces as big as a saucer to chips scarcely as big as a dime." Not one tile that it had was complete, however.

WARNING

From the newel post of Pharaoh's awesome throne: a hungry royal lion clutching a Negro captive. Breakage, not the lion's appetite, is responsible for the missing captive's head.

"It was," writes Mr. Winlock, "as though we had taken a dozen pieces out of each of a hundred different jigsaw puzzles, had mixed them all in one box, and then were trying to make something out of them."

But by helpful exchanges with the Cairo Museum, and by inspecting the pieces in Cairo, the Metropolitan has finally got its display of 40 important tiles put together. The missing pieces of these pictures could be filled out without resorting to sheer imagination.

The tiles of el Kantir are not the first exhibits from Bible palaces to reach America. Twenty fragments of ivory, believed beyond doubt to come from the Palace of Queen Jezebel, were brought to this country last year, to the Fogg Art Museum of Harvard University.

Several thousand fragments of this ivory were unearthed by the Harvard Expedition at Samaria, the capital city of King Ahab and Queen Jezebel in Palestine. For the first time, Bible scholars could see for themselves the evidence of extravagance and luxury, for which the Bible record condemns this pagan queen. That Jezebel actually lived in a House of Ivory had been often questioned. But here were the carved ivory pieces that once adorned the throne, tables, couches, and cabinets of the palace.

It could be seen that some of the ivories were once ornamented with gold foil, inlays of lapis lazuli, and colored glass, making a brilliant background for one of the extravagant and spectacular queens of history. Blackened by fire as many of the scraps were, a number of designs and pictures could be plainly seen.

These ivories have not merely made Jezebel's Palace real, but also indirectly another Bible structure, the Temple of King Solomon. None of the art works of that Temple, so vividly described in the Bible, have ever been unearthed. The ivories of Jezebel's Palace, however, reveal designs that closely match the descriptions of temple designs. Here are lions, oxen, cherubim, wreaths of lily work, and chain work, and palms, all recalling the Biblical description of the Temple, which was built at Jerusalem about a century before Ahab and Jezebel built their Palace.

As tile work was favored in the royal palaces of el Kantir, so ivory was esteemed not only by Jezebel but by King Solomon as befitting royalty. The Book of Kings in the Old Testament declares that Solomon "made a great throne of ivory, and overlaid it with the best of gold." Ivory is mentioned prominently among the cargoes that Solomon's navy brought in from foreign lands.

Like Solomon's Temple, Solomon's Palace in Jerusalem remains hidden somewhere under the ground at Jerusalem. Archaeologists have their views as to where it may be expected to lie. But excavations are forbidden in the city of Jerusalem, now, and that Biblical Palace of stone, cedar and ivory may be a long time coming to light.

Science News Letter, July 13, 1935

ASTRONOMY

Cosmic Rays Suggested as Cause of Light of Night Sky

DO the still mysterious cosmic rays cause the light of the sky at night? Science is gradually accumulating evidence which rules out scattered sunlight as the source of this "night light."

Night light is the faint but distinguishable radiation which comes from the space between stars. It is separate and distinct from the aurora borealis, although its colors resemble the latter.

Dr. Joseph Kaplan, University of California physicist, told astronomers at the meeting of the Pacific section of the American Association for the Advancement of Science that new studies on the midnight maximum of "night light" removes the sun as a possible cause of this nocturnal glow.

It was formerly believed that the sun's radiation striking atoms high up in the region above the stratosphere excited them during the daytime, and that after sun-down they gradually released this stored up energy in the form of light.

Dr. Kaplan believes, however, that cosmic rays cause the "night light." Most of the cosmic ray energy, as is known by the extensive researches of Dr. Robert A. Millikan, Dr. A. H. Compton and other cosmic ray investigators, is absorbed high in the upper atmosphere where the light of the night sky originates.

In his laboratory, Dr. Kaplan has been able to produce a glow discharge in evacuated tubes whose light is the duplicate of the aurora borealis and is now studying means of duplicating, on earth, the much weaker "night light."

If Dr. Kaplan's theory that cosmic rays cause the light of nocturnal sky is correct, a new means may be found for studying the very penetrating cosmic radiation.

But if "night light" may turn out to be an aid to the cosmic ray studies, it is and has ever been a nuisance to astronomers, for it limits the length of time that photographic plates can be exposed to study very faint stellar objects. The "night light" forms a continuous background which gradually fogs the astronomical plates.

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RADIO

Tuesday, July 16, 3:30 p. m., E.S.T.

WASTE BY WIND AND WATER, by H. H. Bennett, Director, Soil Conservation Service, U. S. Department of Agriculture.

Tuesday, July 23, 3:30 p. m., E.S.T.

THE SCIENCE OF STUDYING HUMAN BEINGS, by Dr. Harvey N. Davis, President, Stevens Institute of Technology.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

ZOOLOGY

X-Rays Stop Tissues From Regenerating Themselves

Newts Receiving Radiation Fail to Grow New Tails; Delayed Dosage Makes Growth Slow and Abnormal

X-RAYS' growth-stopping effects have been critically studied on healthy animal tissues that would ordinarily regenerate themselves, by Dr. Pressley Lee Crummy, working under direction of Dr. H. H. Collins at the University of Pittsburgh. These studies throw light on two regions of biological interest: they furnish a basis for comparison between X-ray effects on normal and abnormal growing tissues such as cancer, and they add information on the curious phenomenon of regeneration, by which certain of the lower animals are able to replace lost body-parts such as tails and legs.

Dr. Crummy experimented on the spotted newt, a long-bodied, long-tailed relative of the more familiar frogs and toads. Amputating the tail-tips of some of these animals, he rayed the cut ends of part of them with appropriate dosages of X-rays at various time-intervals. The others he left unrayed, as "controls." After some weeks he examined the lot.

The "control" animals were found to be going through the normal regenerative procedure, growing themselves new tails as they would after an accident in nature. The rayed newts, on the other hand, were still stump-tailed as the amputation had left them; they had averaged only about a millimeter of new growth—about the thickness of an ordinary knifeblade.

A strange differential effect was observed. Dosages sufficient to inhibit regeneration completely when given immediately after operation, would not stop regeneration when administered some weeks after regeneration was under way. The delayed dosage, however, was found to slow up the growth rate of the limb and to cause abnormalities in the formation of the fingers.

In preliminary experiments, Dr. Crummy tried raying the very tips of some of the newts' tails. Without exception, a degeneration and sloughing off of the tissues took place, reminiscent of the loss of finger-joints suffered by early workers with X-rays, before their destructive powers were known.

In the experiments, of course, due consideration was taken for the feelings of the newts. The operations were performed under anesthesia, and their bodies, except for the parts to be X-rayed, were protected during treatment under a quarter-inch lead shield. Apparently it doesn't bother a newt to lose a piece of leg or tail—perhaps a compensation of Nature for having them bitten off by hungry fish or snapping-turtles. At any rate, they seemed to be quite contented without them, while they grew replacements, and incidentally furnished biologists with excellent material for fundamental studies of growth phenomena.

Science News Letter, July 13, 1935

ENGINEERING

Television For America Promised Within a Year

HIGH detail television within a year is promised by the Radio Corporation of America, probably in the metropolitan area of New York City, David Sarnoff, president of RCA, has announced.

RCA will invest $1,000,000 in the development of a transmitting station, the manufacture of receiving sets, and the formation of a program service which will take the air within twelve or fifteen months.

Declaring that American television is now prepared to give fine detail pictures better than those being used in Europe, Mr. Sarnoff emphasized that the greatest need of the art today is to take it out of the laboratory into the field for future development.

Already pictures with 343 lines to the inch, as compared with the crude 30 lines to the inch pictures of a few years ago, are now available. What one can now see with the present stage of television, Mr. Sarnoff said, is "comparable with what ones sees of a parade from the window of an office building, or a world series baseball game from a nearby roof, or of a championship prize fight from the outermost seats of a great arena."

Television, said the RCA president, will not compete with sound broadcasting in its nationwide scope. The first transmission will be over a circle not of more than 25 miles radius. Wire facilities are not available for wide distribution and such mass-broadcasting is "not here nor around the corner."

An enormous economic sacrifice will be necessary to "put over" television, Mr. Sarnoff indicated, for each advance in the art will make obsolete prior equipment, both transmitting and receiving. The situation will not be comparable to sound broadcasting, where a ten-year-old receiver may still be used if one is not too fussy about the quality. It will, therefore, not be well to have the systems of transmission or receiving standardized too soon on a wide scale if future progress is to be possible.

Science News Letter, July 13, 1935

BIOLOGY

Nature Levies Penalties For Destroying Her Mosaic

"NATURE'S Mosaic," the myriad-pieced jigsaw puzzle of living plants and animals that automatically fits itself together to cover all habitable spaces on the earth is self-maintaining, self-restoring when man is not too meddlesome. But let him presume too much, disturb the pattern too drastically, and Nature takes sharp toll of retribution.

That is one of the lessons of what has been happening in the West recently, Dr. George J. Peirce, emeritus professor of botany at Stanford University, pointed out in an address given under the auspices of Science Service.

Dr. Peirce said, in part: "If breaking the native sod, clearing the land, and sowing to grain be followed by prolonged and intense drought, the crops will fail, there will be no cover and no binder to the soil, the wind will pick it up, carry it away, and finally deposit it in those places where it is least desired. On the marginal lands of the Dakotas and of the western dry belt the would-be farmer smashed the Mosaic of Nature.

"He has suffered variously for years, producing crops of political, social and economic ideas repugnant to those less bold or less original persons who remained where water, soil and climate are less threatening. Finally the continued threat has been carried out, good soil has been lifted and whirled away, the former owner impoverished, the recipient embarrassed. A return of the soil to Nature is impossible. The Mosaic is not only broken, it is dissipated. (*Turn to page* 30)

"Erosion control is more than a charitable impulse, a vote-getting device, or a euphemism for a dole. It is a conscious, intelligent effort to repair, as rapidly as possible, what has been damaged by road cutting, by down-hill instead of horizontal plowing, by the destruction of the forest cover by fumes, and by other interferences with the established pattern of Nature. It checks the run-off after rain and melting snow; it prevents the scouring and scoring of hillsides; it reduces the risk of freshets; it lightens the load of silt carried by the streams.

"It is one of the finest examples of man's undoing by cooperation the harm which he has done individually in unintelligent self-interest. It is a partial fulfilment of the promise which the biologist sees of increased comfort, improved health, and greater happiness for all in such study and understanding as will lead man to be a harmonious and not a rebellious part of the Mosaic of Nature."

Dr. Peirce's address was put on the air over the network of the Columbia Broadcasting System.

Science News Letter, July 13, 1935

ARCHAEOLOGY

One Door or Three, Never Two, Believed Mayan Rule

A PUBLIC building may have one door or three, but never two.

Archaeologists who recently counted doors in ruined cities in tropical America have wondered whether this could actually have been a strange building rule of Mayan architects, centuries ago. Now, through important new discoveries at ruins of Yaxchilan, famous Mayan city, the belief is confirmed.

Reporting the discoveries to the University Museum, Philadelphia, Linton Satterthwaite, Jr., leader of an expedition to the Mexican-Guatemalan border country, states that Yaxchilan had previously seemed to contradict the theory of uneven numbers of doors. Several partially cleared buildings had revealed only two doorways.

At the suggestion of Dr. Sylvanus G. Morley of the Carnegie Institution of Washington, who recently advanced the theory of the uneven doors, Mr. Satterthwaite directed further clearing of the Yaxchilan buildings, and in each instance found a third doorway.

"The great importance of these doorways," Mr. Satterthwaite stated, "lies in their sculptured and inscribed lintels, which bear on their surface bas-reliefs similar in subject and technique to the enormous monolithic stelas familiar in Mayan art, but far superior to the latter because of the delicacy of workmanship required for their small size.

"Of the inscriptions, only numbers and dates in the Mayan calendar can be deciphered with certainty but where these are present they almost invariably yield the exact date of the bas-relief and therefore presumably of the building as well. It is possible, therefore, to place all such dated examples in strict chronological sequence, to a degree possible in the study of no other ancient art.

"In addition to the lintels we also found and photographed a hitherto unnoticed altar lying overthrown in the jungle growth, as well as a large new fragment to add to a previously known stela.

"Among these discoveries are two sculptures which will take their place among the outstanding specimens of Mayan art so that in addition to their importance as historical documents they are of major interest for their artistic achievement and for the religious scenes they bear."

Science News Letter, July 13, 1935

MUSEUM SCIENCE

Urges Medical Ethics For Restorers of Paintings

BEAUTY doctors of the art world who perform dangerous operations on important and famous paintings, to prolong their life and restore their loveliness, may yet be required to obtain a license, just as a surgeon is required to do.

Comparing the "health" of a Titian painting to the health of a human being, E. W. Forbes, director of the Fogg Art Museum, Cambridge, Mass., speaking in Washington, stressed the need of adopting high standards for art restorers, patterned after medical ethics and professional requirements. Mr. Forbes addressed the American Association of Museums.

Art restorers, who treat such ailments of paintings as cracked paint, dirt, discolored varnish, and over-painting, have long inclined to the practice of cherishing their personal trade secrets and discoveries. This should be abandoned, Mr. Forbes urged.

"It is as unethical for a restorer to retain for his own private use any wonderful discovery which he makes," declared Mr. Forbes, "as it would be for a doctor to conceal from the world some great discovery which he might make to enable him to cure, let us say, cancer or tuberculosis."

Art restorers are now offered a way of handling this matter of sharing their discoveries. Mr. Forbes stated that a journal, similar to the journals of medical science, has been provided in which art restorers can publish their researches.

He expressed the hope that, with all serious students in the field combining forces, in ten years or more "we shall have a group of competent restorers who know more than any restorer does know now, or ever has known."

Licensing art restorers, as doctors of medicine are now required to be licensed, is foreseen by Mr. Forbes, who predicted a time when a commission of competent people may be named to judge which art restorers should be licensed to perform dangerous operations on great pictures.

Science News Letter, July 13, 1935

HOME ECONOMICS

Find Way to Feed "Cattle Food" to Humans

A WAY to feed grain sorghum to humans, and make them like it, has been devised by dietitians.

How ordinary recipes may be altered to use these "cattle feed" grains in biscuit, muffins and steamed breads has been reported to the American Home Economics Association.

The experiments, by Emma L. Bond and Helen B. Burton of the University of Oklahoma, are expected to be useful in sections of the country where grain sorghums are produced. Persons who cannot eat wheat because of sensitiveness to that form of protein may also find sorghum bread useful, the experimenters suggested. The grains used in the experiments were dwarf yellow milo and black hull kafir corn.

Science News Letter, July 13, 1935

In his studies of ability of adults to learn, Prof. E. L. Thorndike finds that "a man at 65 may expect to learn at least half as much per hour as he could at 25 and more than he could at the ages of eight to ten years."

BOTANY

NATURE RAMBLINGS
by Frank Thone

Fray Junipero's Flower

CALIFORNIA boosters never tire of telling us that their coast is quite as good as a summer resort as it is as a winter playground. They are right about it, too, if only one keeps close to the water; California valleys can get pretty bad in summer. But the seashore is fine. No rain falls all summer long, and the hills and mesas go brown and desert-like. Yet in among the chaparral, and along the shore dunes, and under the pines at Torrey Hill or the cypresses at Monterey, one can find astonishingly beautiful flowers even in the drought.

High among the flowers in California's crown must be rated the California poppy. Its beautiful golden cups, tinged with red at the bases of the petals, shine bright above the sage-green foliage, and make the plant an ideal one either for natural ground-carpet in the wild or for low borders in the garden. It is one of the best of American contributions to floriculture, the more so since it is still evolutionally plastic and has yielded new varieties in abundance, some of them deep orange or almost pure red.

The California poppy offers an excellent example of the happy guess sometimes made in popular nomenclature. Strictly speaking it is not a poppy, though it is a member of the poppy family. But people of no botanical skill saw the resemblance and applied a most happy and appropriate name.

There is a lovely legend told in California, about the founder of the great chain of old Spanish missions, Father Junipero Serra. It is said that when he saw his first California poppy, with its splash of red at the bottom of the cup, he plucked it up and offered it to God as though it were the chalice at the altar. The story would be worthy of inclusion in the *Fioretti* of St. Francis of Assisi.

Science News Letter, July 13, 1935

PHYSIOLOGY

Blindness In Children May Result From Depression Diet

LACK of proper food for families hit by the depression may "take a horrible toll" in increased numbers of sightless children, Dr. Emanuel M. Josephson, eye specialist, of New York City, warned the meeting of the Eugenics Research Association.

The public should be warned that unbalanced depression diets, lacking in the proper vitamins, may result in eye disease and blindness, he said. And these diseases may be handed on to future generations, so that America's children yet unborn may suffer if families today are not properly fed.

Inexpensive foods added to the depression diet may prevent the development of this "hunger blindness." Carrots and other vegetables, and cod liver oil are among the foods which protect against it.

A family in which almost half the descendants of one grandmother suffered from cataracts, a condition of the eye which gradually veils the sight, was reported by Dr. Josephson as an instance of how the tendency to eye disease may be inherited but brought on by living conditions. Although so many members of this particular family developed cataracts, some of them beginning before the birth of the child, another branch of the family in better financial condition did not have a single case of this disease down to the third and fourth generations.

Cataracts are not the only eye disease which may result from environmental conditions such as malnutrition, Dr. Josephson pointed out.

Day blindness, a disease common in the poorer countries of the Orient, which causes the patient to see less by daylight than at night, has become widespread in the United States for the first time during the depression. This disease, and its later stages nightblindness and keratomalacia or softening of the cornea, and xeropthalmia (dry eyeball), are due to lack of vitamin A in the diet.

"If America wishes to take no risk of becoming, like China, a country with a high incidence of blindness and eye disease due to prolonged malnutrition, prompt action must be taken," Dr. Josephson concluded.

Science News Letter, July 13, 1935

ENGINEERING

Soundproofing Gives Wall Look of Underground Cave

See Front Cover

THE microphone shown on the front cover of this week's SCIENCE NEWS LETTER is not broadcasting from among the stalactites of some underground cavern. The curious formations shown are nothing more romantic than cotton waste covering the walls and ceiling of a soundproof room in the General Electric Company's general engineering laboratory at Schenectady, N. Y.

The waste is thus used to minimize reflection and resonance of sound generated within the room. Sensitive sound-measuring instruments are calibrated there and then taken to another soundproof room to determine the amount and types of noise prevalent in motors, and other electrical apparatus.

Science News Letter, July 13, 1935

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•First Glances at New Books

Nutrition

NUTRITION WORK WITH CHILDREN —Lydia J. Roberts—*University of Chicago Press,* 639 p., $4.00 Revised and enlarged to cover new developments in the field since the appearance of the first edition in 1927.

Science News Letter, July 13, 1935

Economics

DYNAMIC ECONOMICS — Charles F. Roos—*Principia Press,* 275 p., $3.50. Subtitled "Theoretical and Statistical Studies of Demand, Production and Prices," this monograph of the Cowles Commission for Research in Economics presents pleas for dynamic econometrics and formulates equations and theories over a wide sociological range.

Science News Letter, July 13, 1935

Biological Chemistry

LES CAROTENOIDES DES ANIMAUX—Edgar Lederer—*Hermann et Cie, Paris.* 62 p., 15 fr.

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Geology

INTRODUCTION TO PHYSICAL GEOLOGY—W. J. Miller—*Van Nostrand,* 477 p., $3.25. Third edition of a substantial and successful textbook for college use.

Science News Letter, July 13, 1935

Zoology

LEÇONS DE ZOOLOGIE ET BIOLOGIE GÉNÉRALE — Georges Bohn — VOL. VII — VERTÉBRÉS SUPÉRIEURS (OISEAUX ET MAMMIFERES)—*Hermann et Cie., Paris,* 131 p., 18 fr.

Science News Letter, July 13, 1935

Hydrodynamics

THÉORIES MÉCANIQUES — VOL. I—LA THÉORIES STATISTIQUE DES FLUIDES ET L'ÉQUATION D'ÉTAT—J. Yvon—*Hermann et Cie., Paris.,* 48 p., 15 fr.

Science News Letter, July 13, 1935

Physics

EXPOSÉS SUR LA PHYSIQUE DES SOLIDES—VOL. I—SEMI-CONDUCTEURS ÉLECTRONIQUES — A. J. Joffé — *Hermann et Cie., Paris,* 90 p., 20 fr.

Science News Letter, July 13, 1935

Chemistry

WORLD CHEMICAL DEVELOPMENTS IN 1934 (Bureau of Foreign and Domestic Commerce, Trade Information Bulletin No. 823)—*Gov't. Printing Office,* 132 p., 10c. This bulletin presents recent world chemical developments and shows the trend in chemical trade from the point of view of markets, sources of supply, and competition.

Science News Letter, July 13, 1935

Entomology

THOMAS LINCOLN CASEY AND THE CASEY COLLECTION OF COLEOPTERA—R. S. Bassler—*Smithsonian Institution,* 15 p., 1 pl., 10c. A brief biological note on a soldier who was also a scientist, with description of his notable collection of beetles and a bibliography of his entomological publications.

Science News Letter, July 13, 1935

Physiology

THE SECRET OF KEEPING FIT—"Artie" McGovern—*Simon and Schuster,* 251 p., $2. A physical culturist gives sane advice on keeping fit, reducing, and similar interesting topics. The book is easy to read because of its direct, colloquial style. Directions, illustrated by drawings, are given for more than twenty exercises.

Science News Letter, July 13, 1935

Public Health

RECORDING OF LOCAL HEALTH WORK —W. F. Walker and Carolina R. Randolph—*Commonwealth Fund,* 292 p., $2. Not of general interest, but health officers and their staffs will find this book valuable. It contains detailed information on what experts have found to be the most efficient methods of keeping public health records.

Science News Letter, July 13, 1935

Medicine

THE ART OF PUBLIC HEALTH NURSING—Edith S. Bryan—*W. B. Saunders,* 296 p., $2. Of special interest to nurses, since it is designed to teach them the "art" of public health nursing; but also probably of some interest to persons wishing to introduce or to build up public health nursing in their own communities.

Science News Letter, July 13, 1935

Vital Statistics

THE MORTALITY FROM CANCER . . . 1911 to 1930—*Metropolitan Life Ins. Co.,* 91 p., free. If requested through Science Service, please enclose 10c handling charge.

Science News Letter, July 13, 1935

Medicine

PRACTICAL NEUROLOGICAL DIAGNOSIS—R. Glen Spurling—*Charles C. Thomas,* 244 p., $4. For physicians and medical students.

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Physiology

TWELVE HOURS OF HYGIENE—F. L. Meredith—*Blakiston's,* 397 p., $1.90. A direct, readable style and careful selection of material make it possible for this author to give a large amount of important information within the brief space of a text for a short college course in hygiene.

Science News Letter, July 13, 1935

Medicine

TUBERCULOSIS IN THE CHILD AND THE ADULT—A. M. Pottenger—*C. V. Mosby,* 611 p., $8.50. A technical book for physicians, not for general lay reading.

Science News Letter, July 13, 1935

Toxicology

ALTÉRATIONS DU SANG DANS LES INTOXICATIONS PROFESSIONNELLES — René Fabre—*Hermann et Cie., Paris.,* 48 p., 12 fr.

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Paleontology

DESCRIPTION OF SOME NOTOUNGULATES FROM THE CASAMAYOR (*NOTOSTYLOPS*) BEDS OF PATAGONIA—Elmer S. Riggs and Bryan Patterson—*American Philosophical Society,* $1. Patagonia is to paleontologists of the present generation what our own Northwest was to Cope, Marsh, Leidy and their compeers. This publication describes a number of primitive hoofed mammals.

Science News Letter, July 13, 1935

Toxicology

LEÇONS DE TOXICOLOGIE — René Fabre—*Hermann et Cie., Paris,* Vol. I, 99 p., 15 fr.; Vol. 2, 68 p., 12 fr.

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Hygiene

HYGIENE AND SANITATION — Jesse Feiring Williams—*W. B. Saunders,* 372 p., $2. Third edition, revised and brought up to date, of a well-known textbook.

Science News Letter, July 13, 1935

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